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**Thomas et al.**

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(54) **DOOR WITH VARIABLE LENGTH SCREEN**

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(51) **Int. Cl.**<sup>7</sup> ..... **E06B 9/52**

(52) **U.S. Cl.** ..... **52/63; 52/455; 160/100**

(58) **Field of Search** ..... 160/27, 28, 99, 160/100; 52/63, 455

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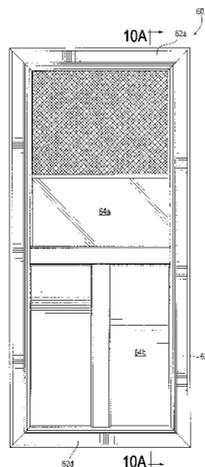
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(57) **ABSTRACT**

An exterior door incorporates at least one moving glass insert or sash slidable in first and second spaced apart tracks. An end of the insert is coupled to an end of a spring biased rolled screen. As the insert moves from the roll, the screen is extracted therefrom providing a continuously variable screened region in the door. The insert can be positioned using a counterbalance or spaced apart latchable locations in the door.

**22 Claims, 15 Drawing Sheets**



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Fig. 1C

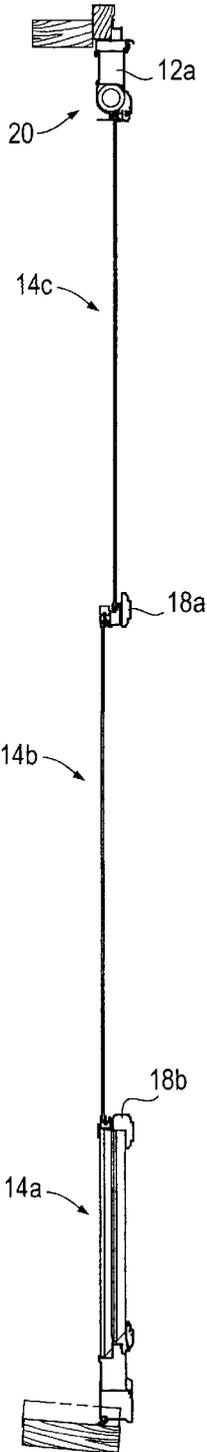


Fig. 1B

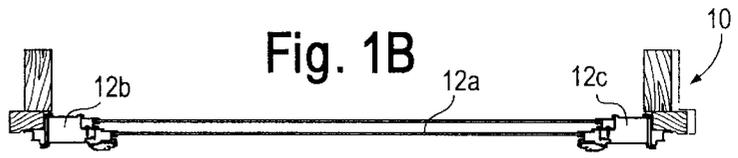
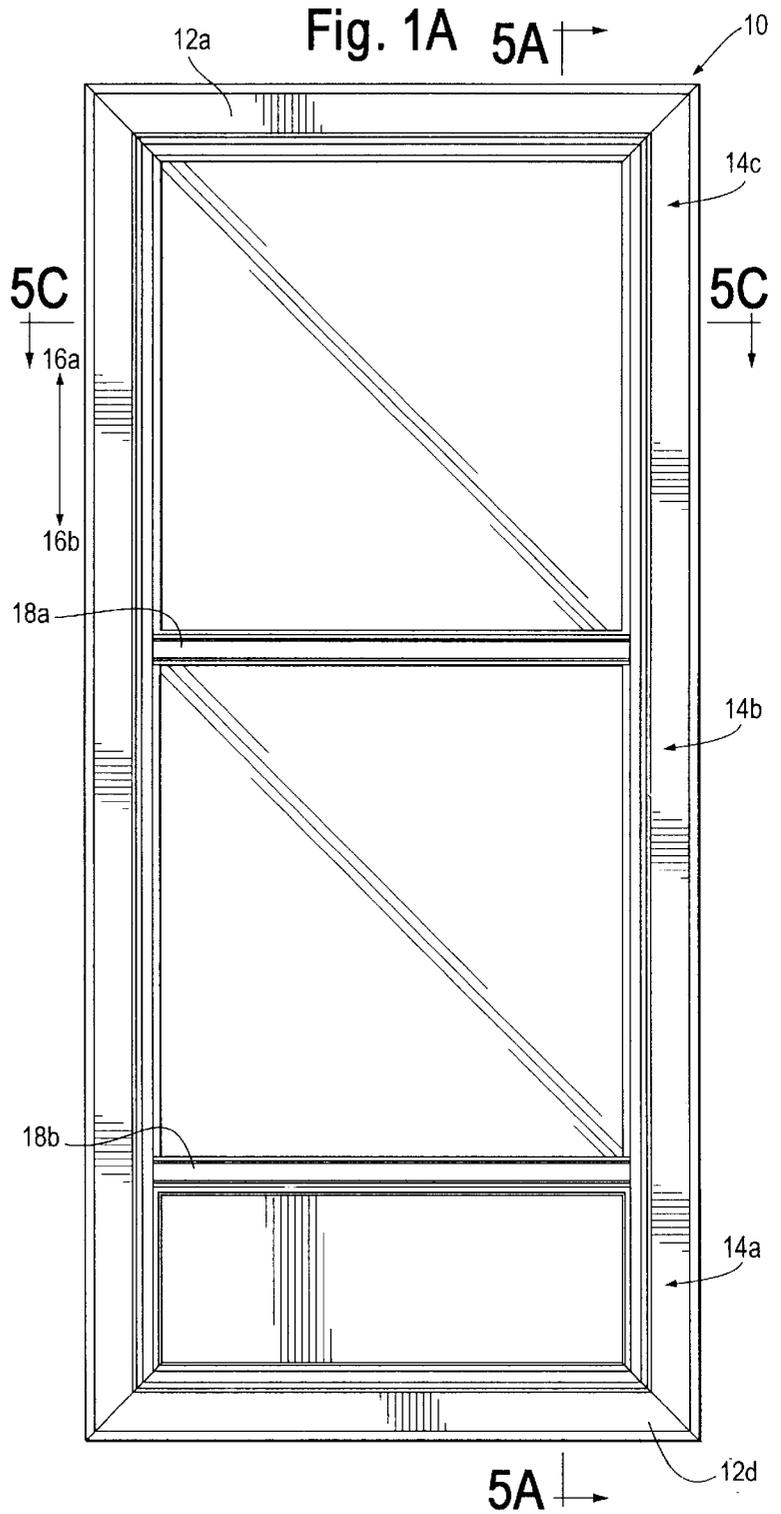
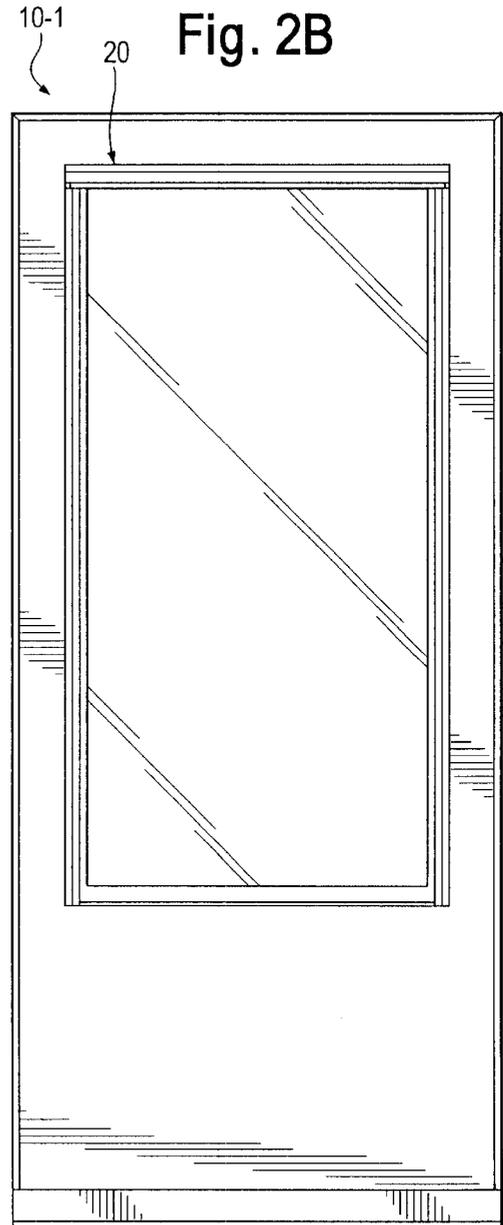
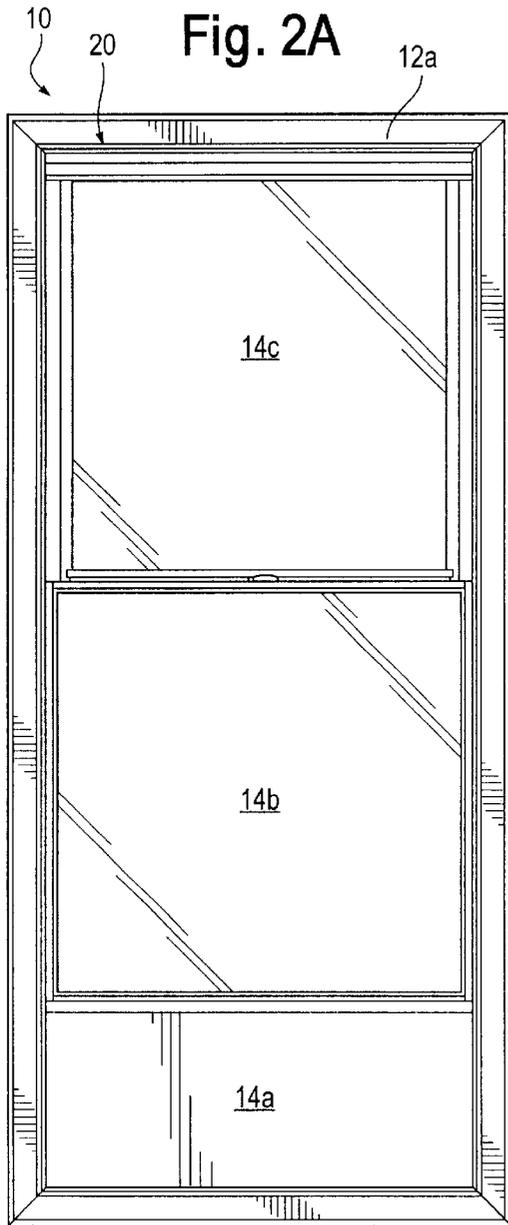


Fig. 1A





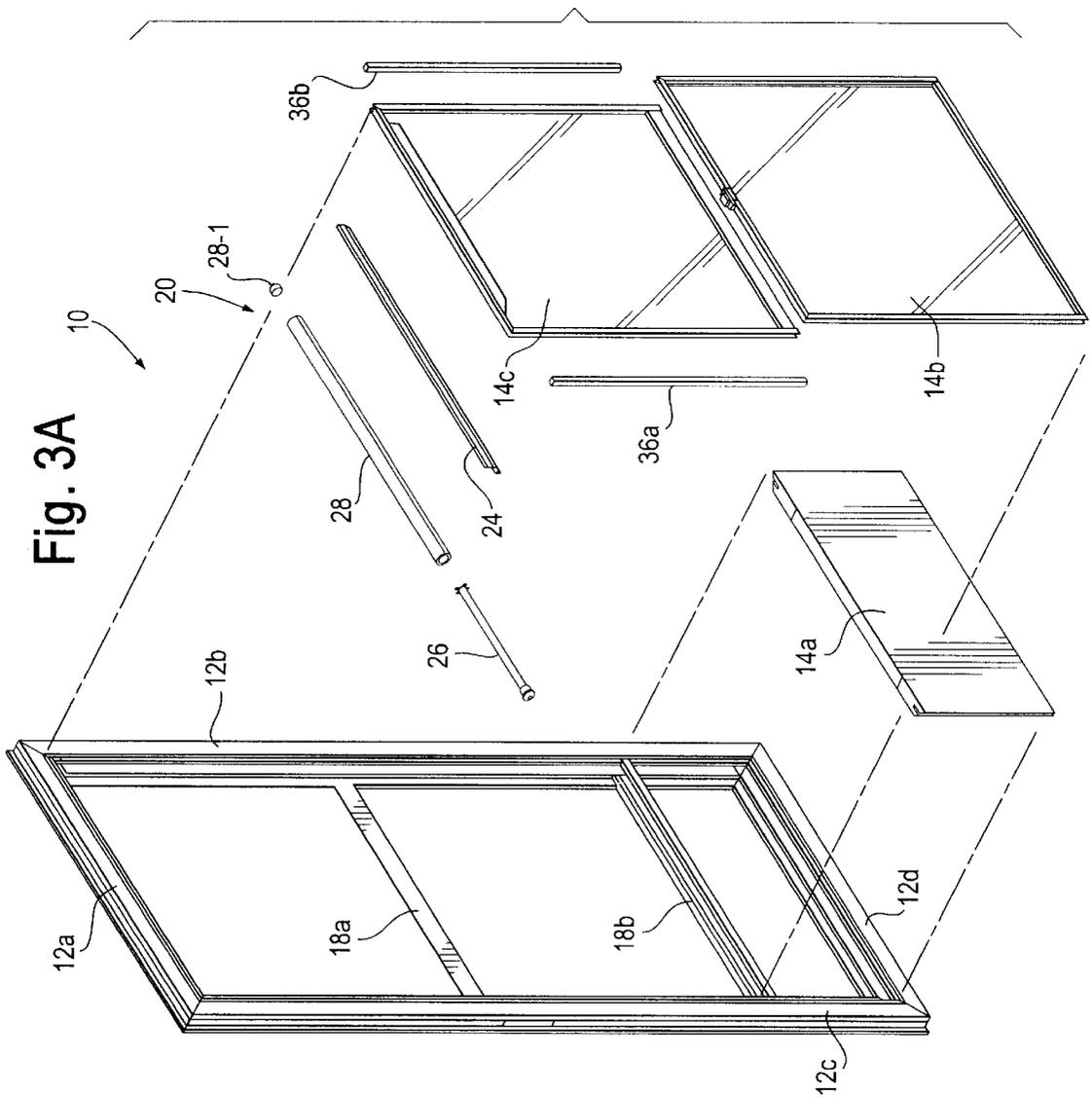
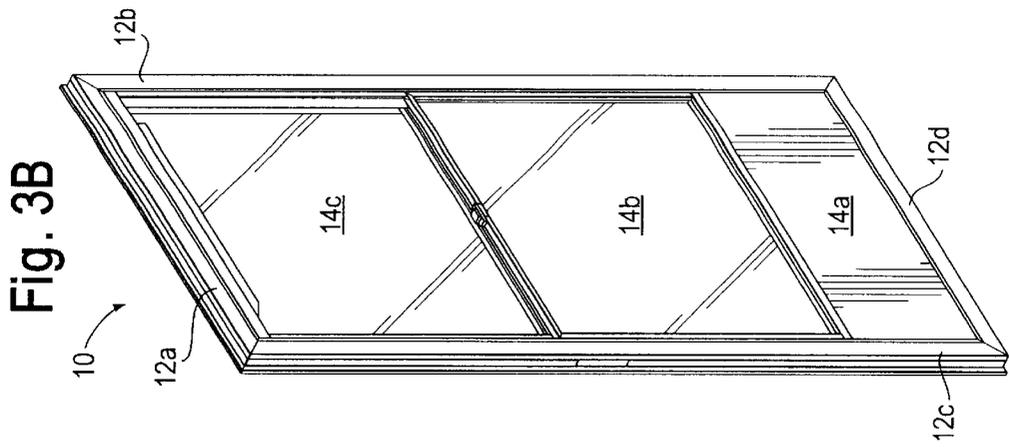


Fig. 4B

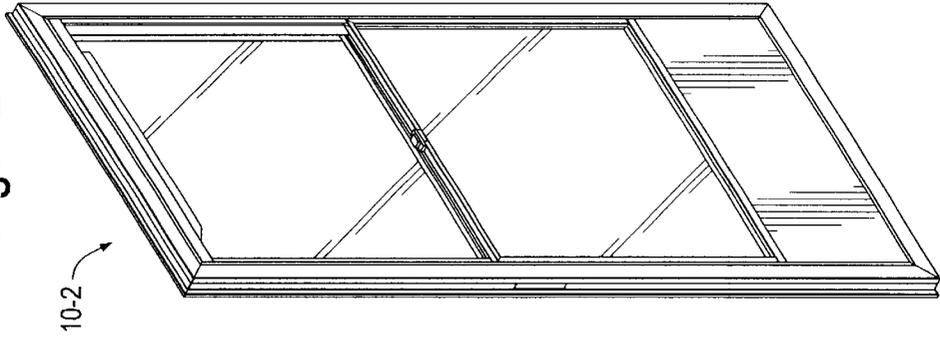


Fig. 4A

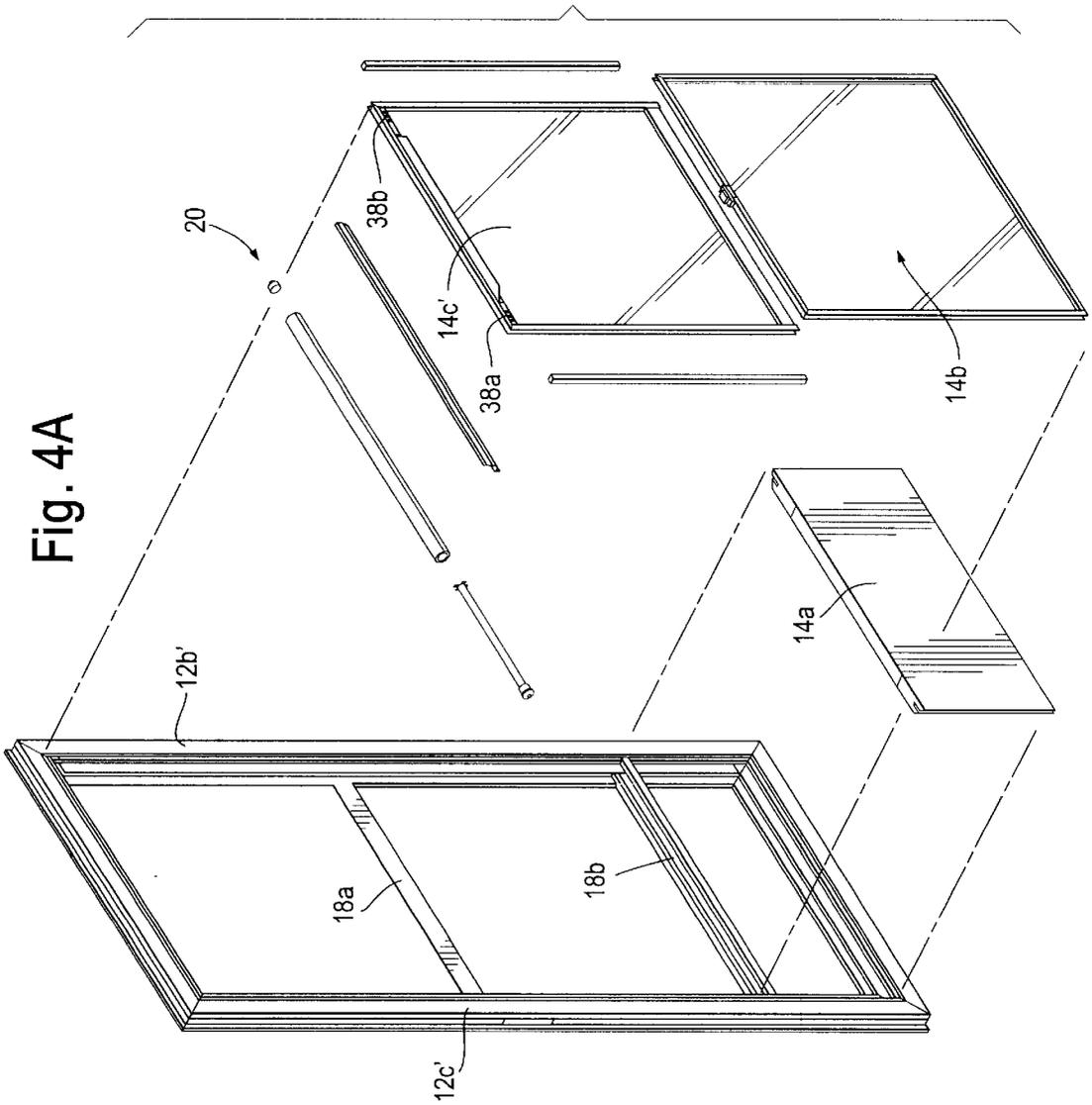




Fig. 5C

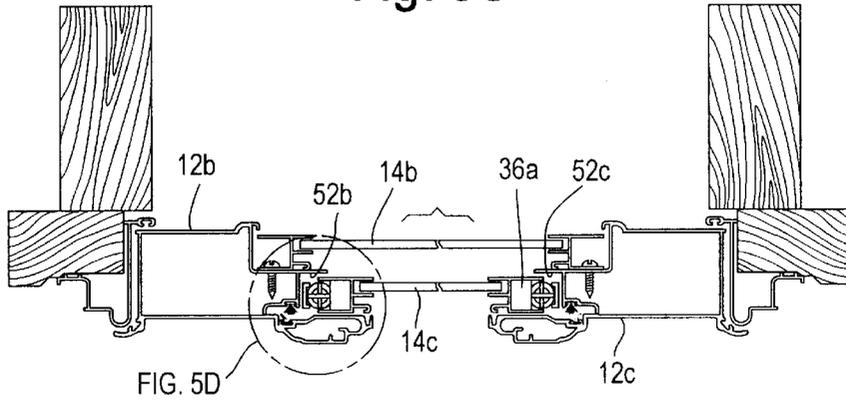


Fig. 5D

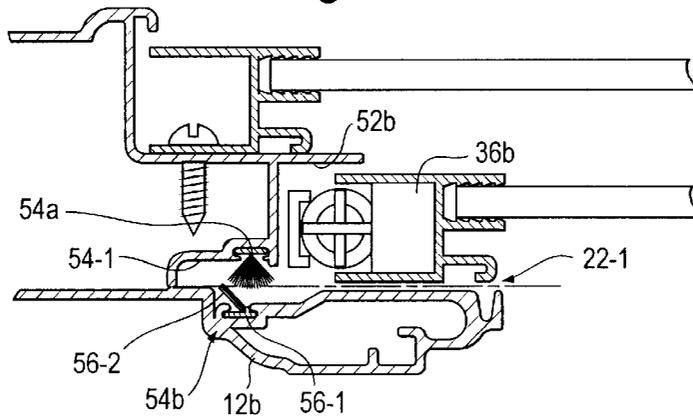


Fig. 5E

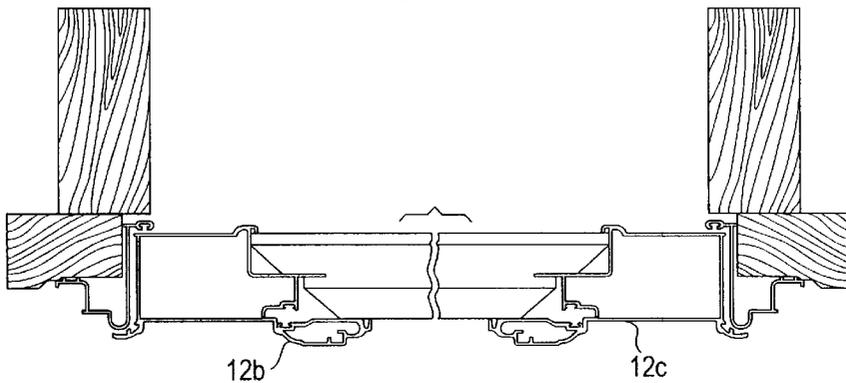


Fig. 5F

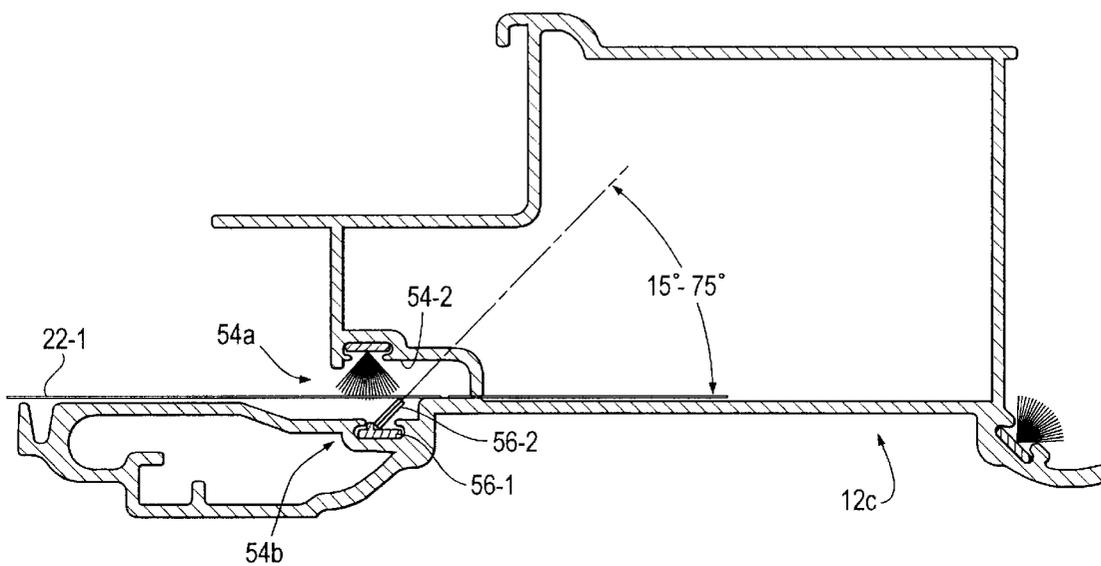


Fig. 5G

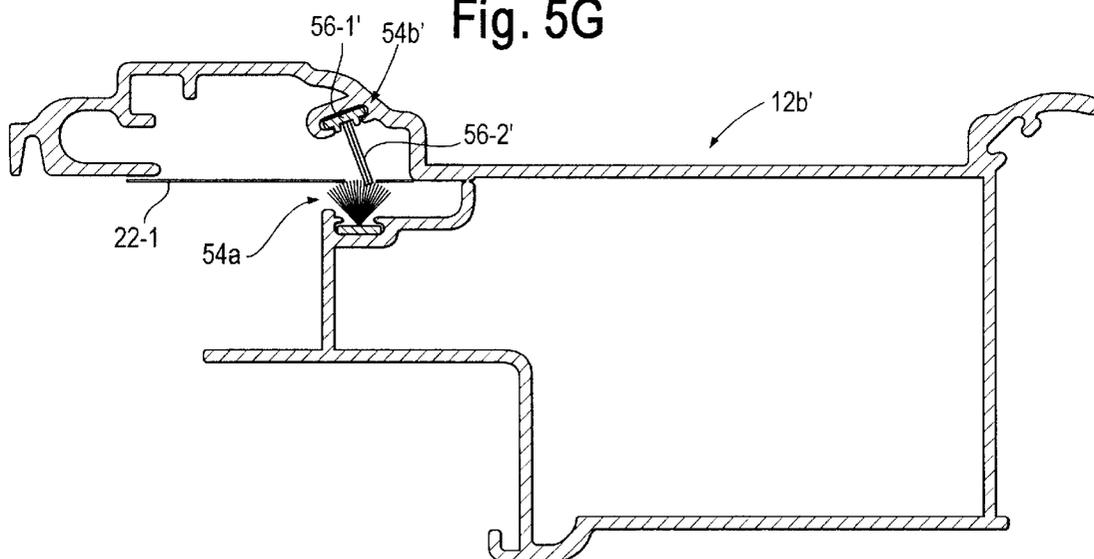


Fig. 6A

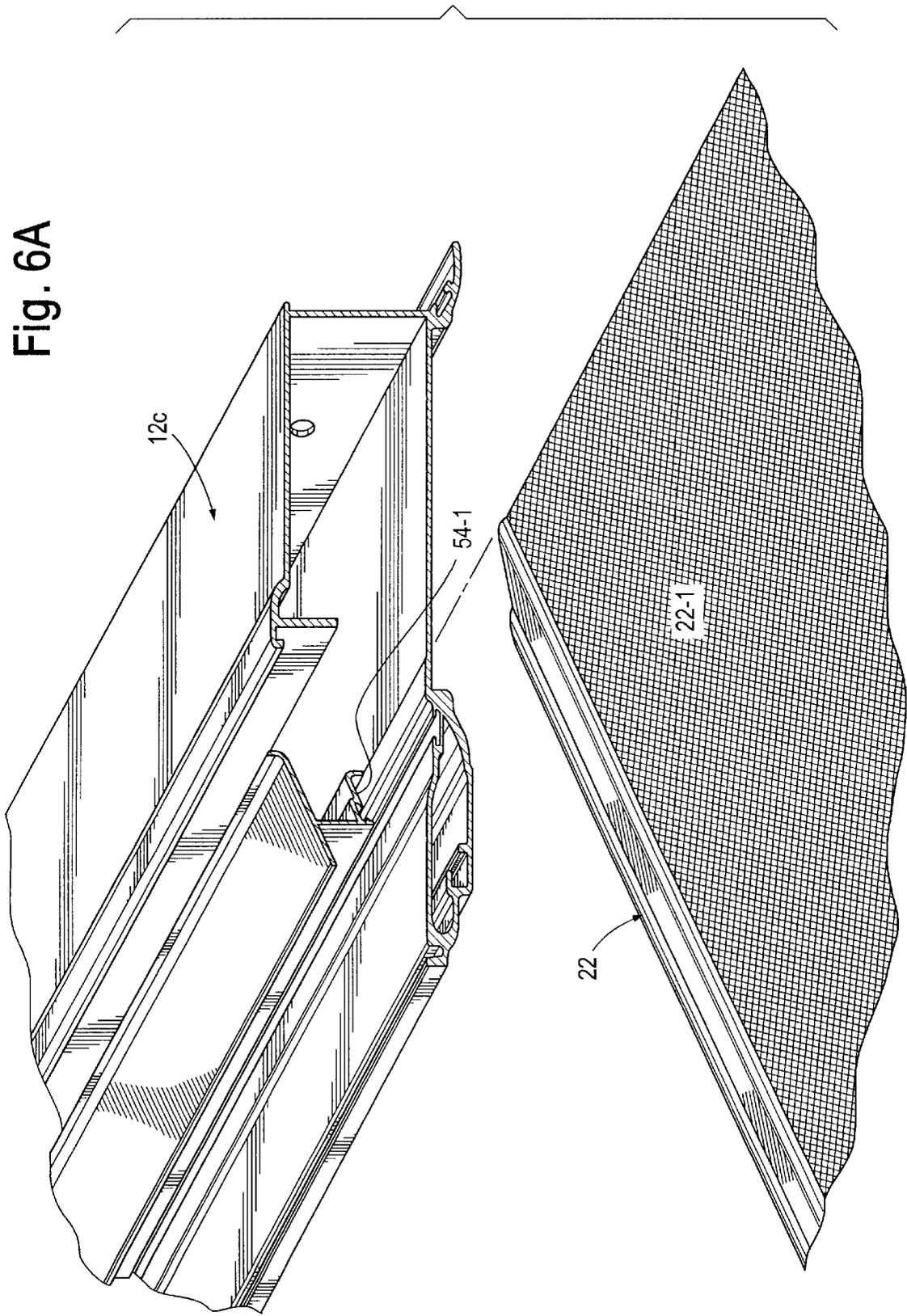


Fig. 6B

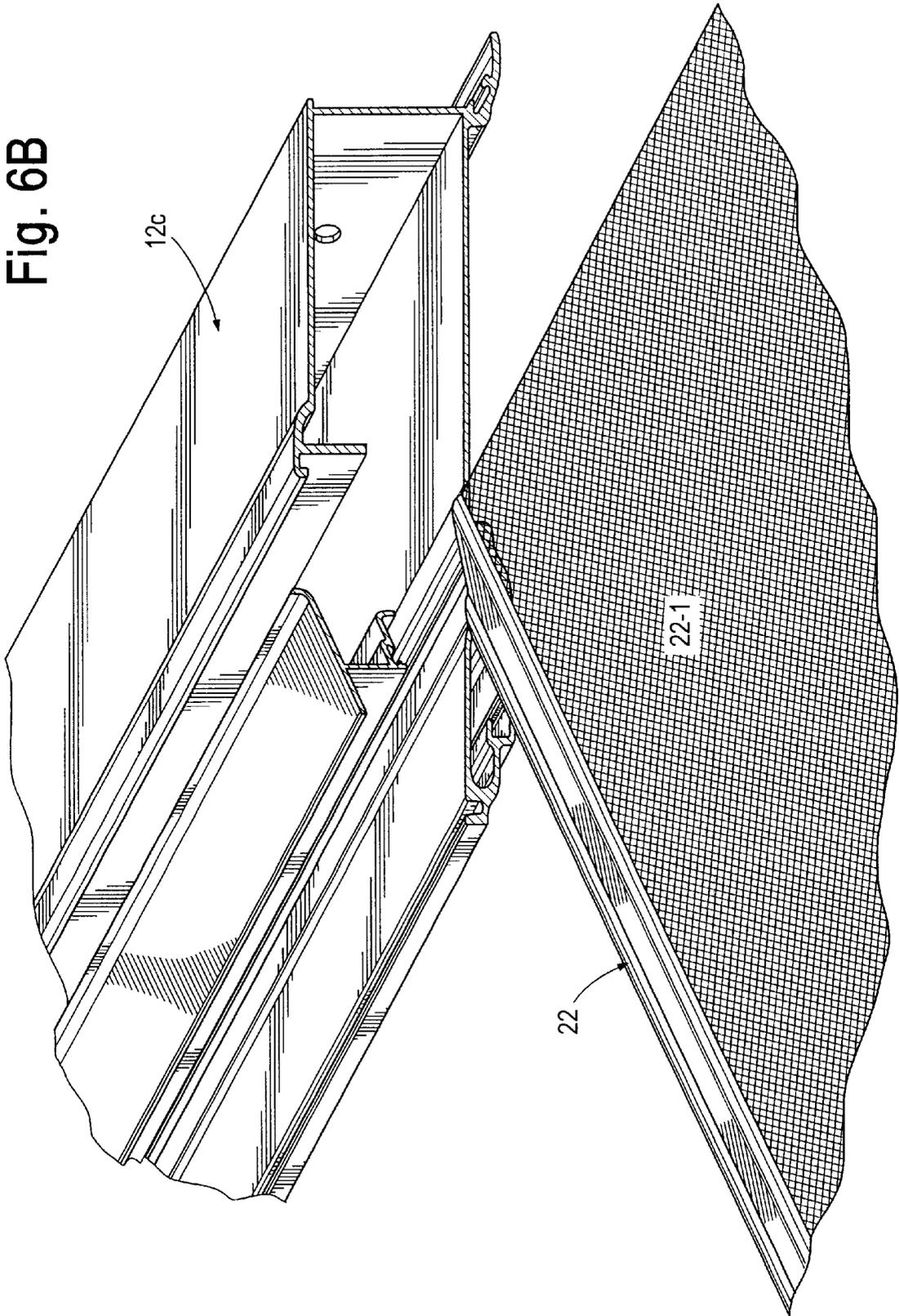
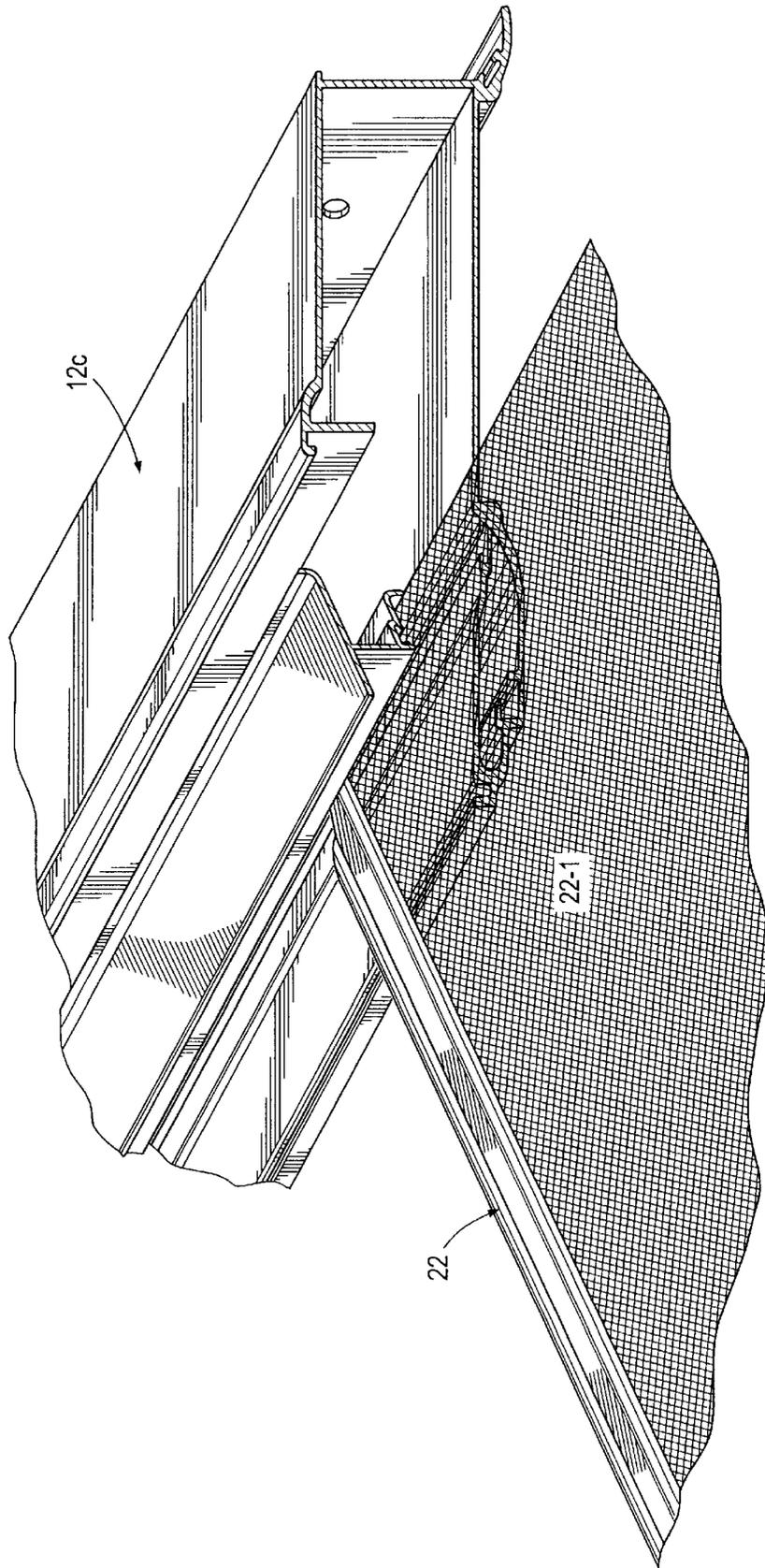


Fig. 6C



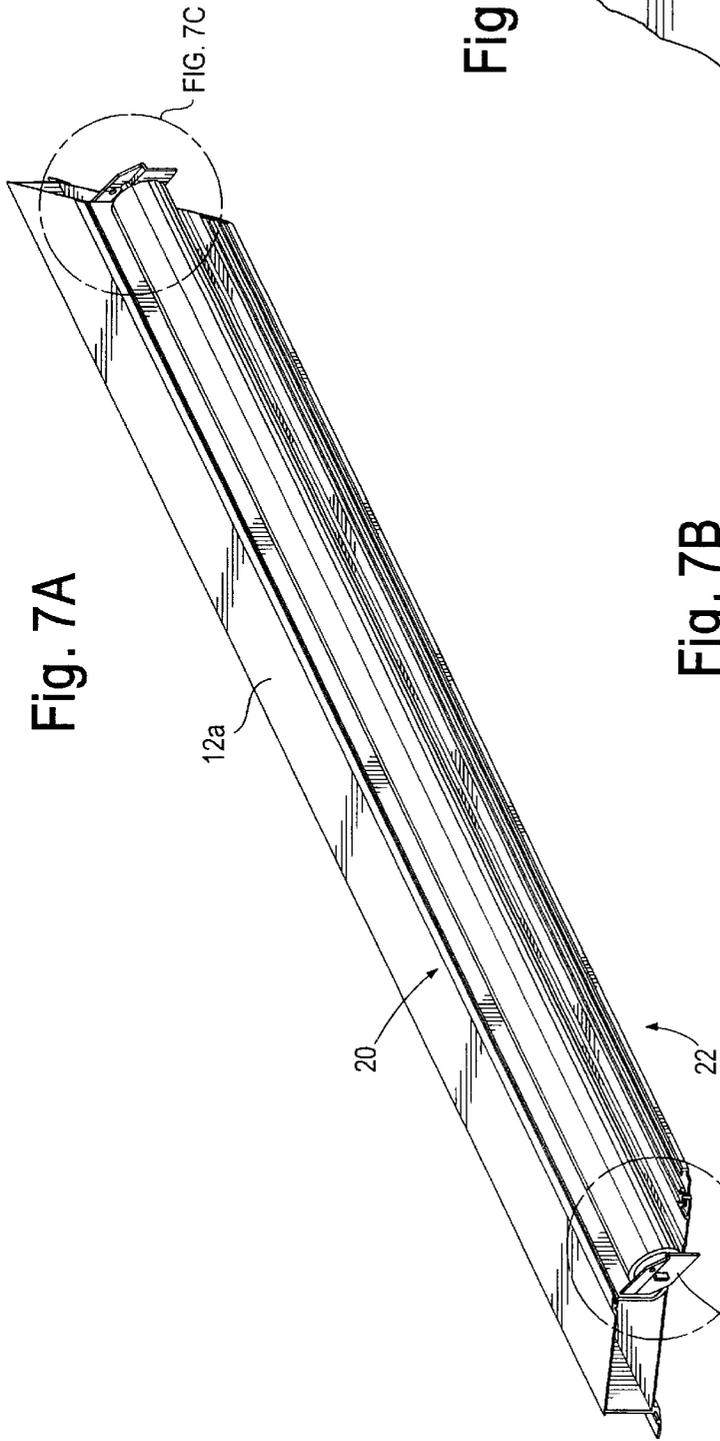


Fig. 7A

Fig. 7C

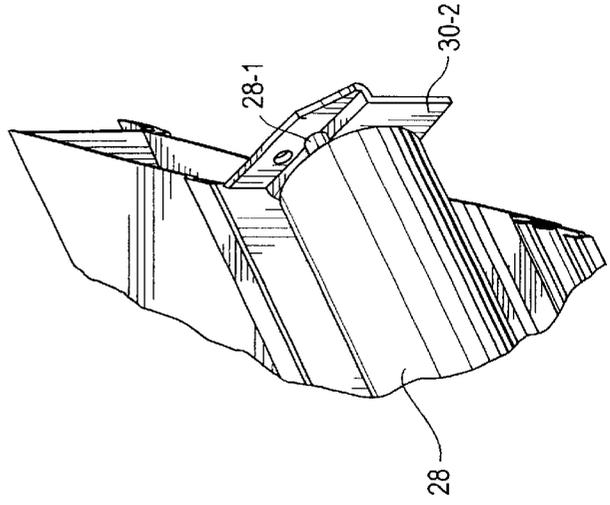


Fig. 7B

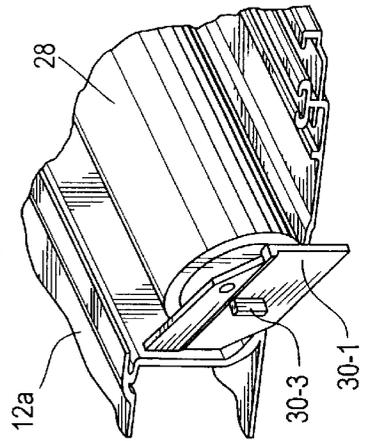


Fig. 8

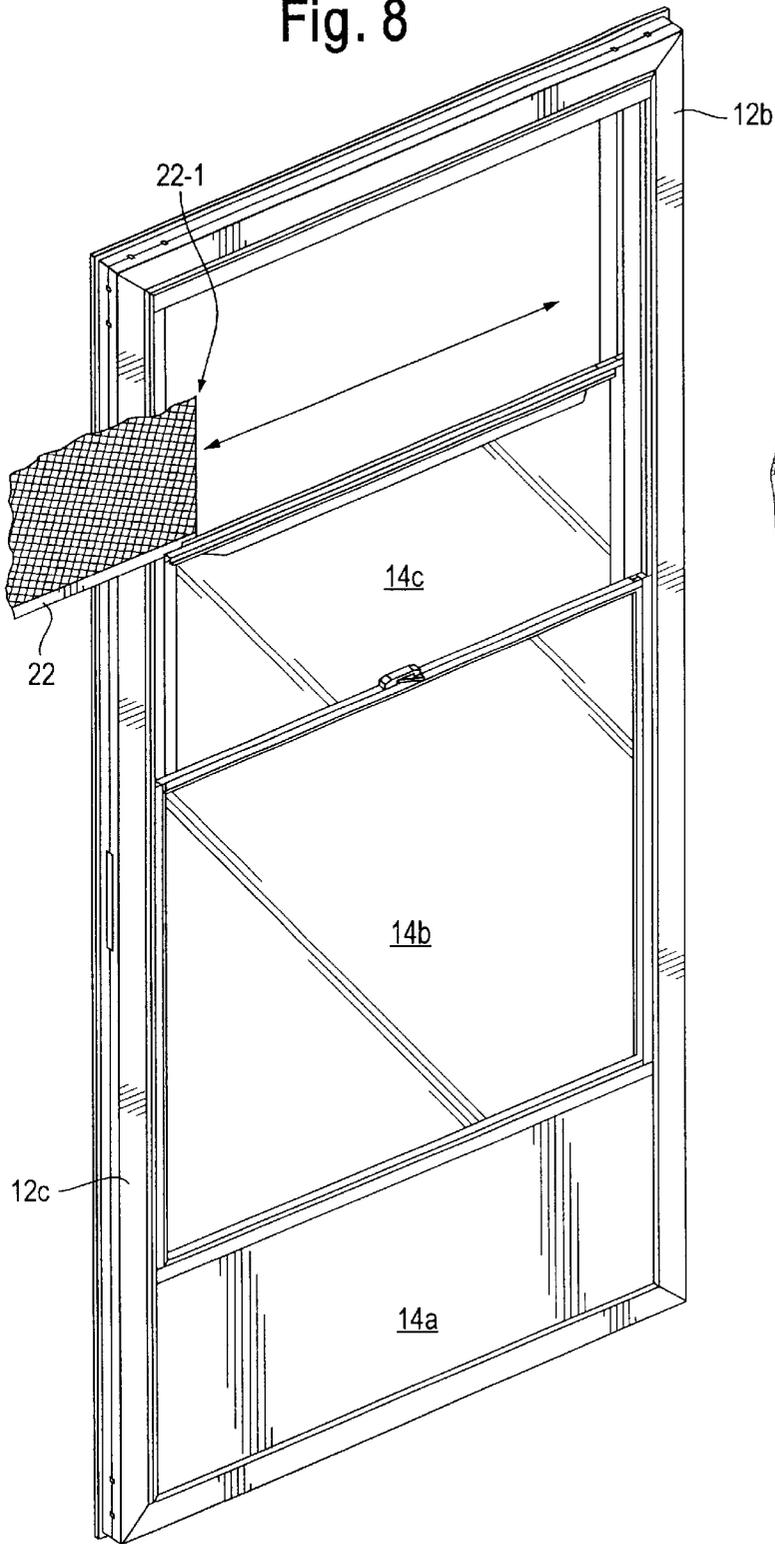


Fig. 9

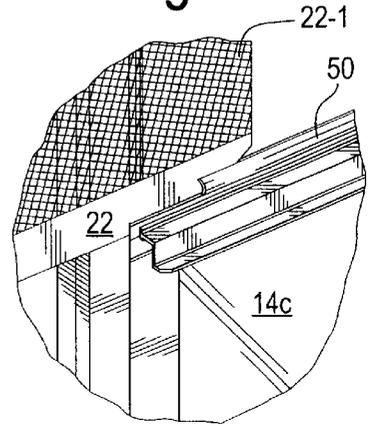


Fig. 10

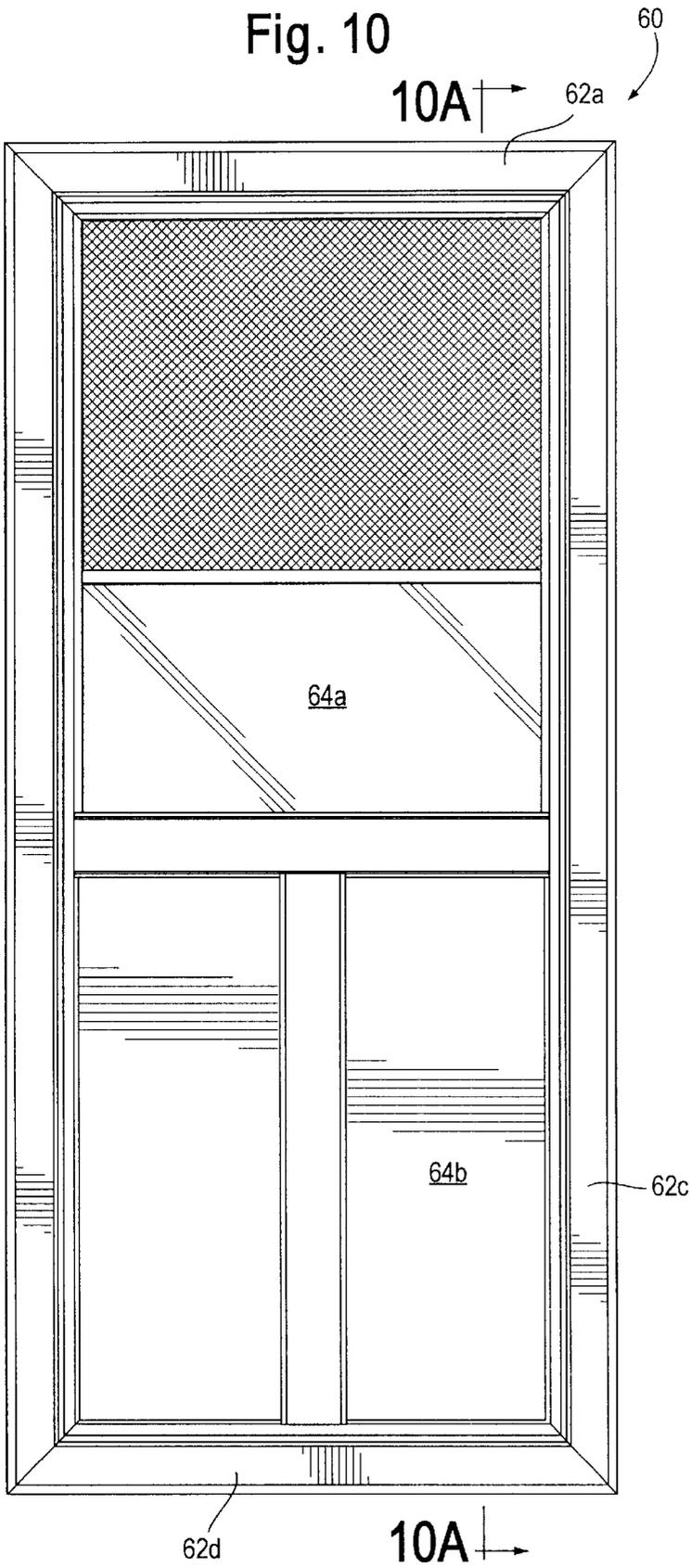


Fig. 10A

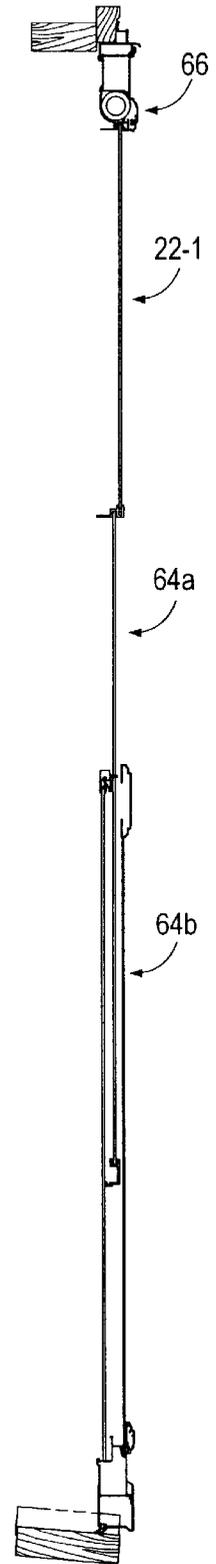


Fig. 11A

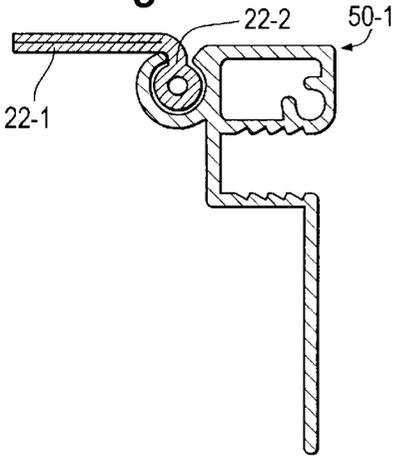


Fig. 11D

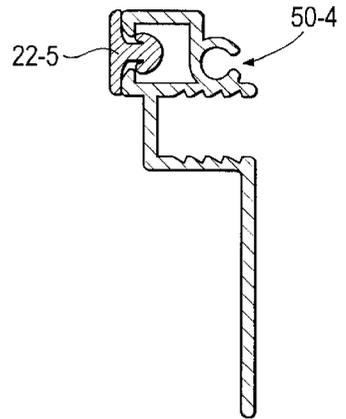


Fig. 11B

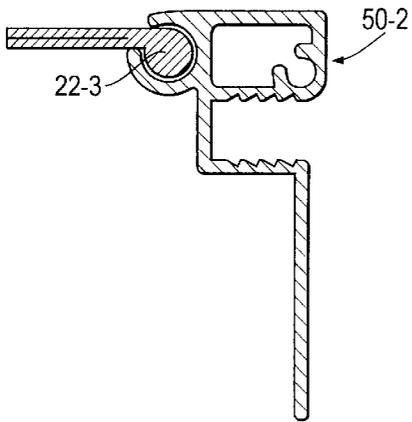


Fig. 11E

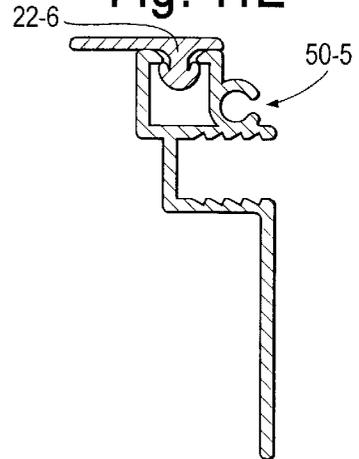


Fig. 11C

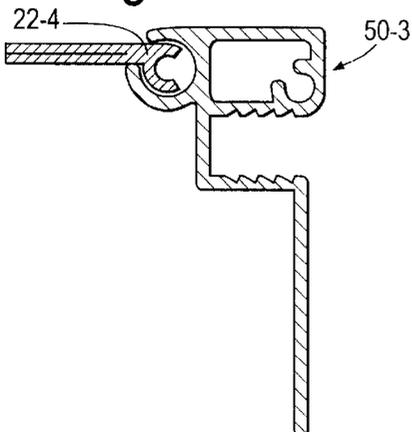
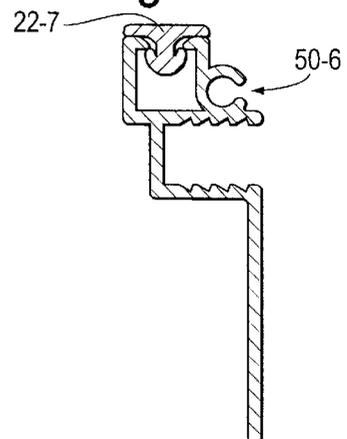
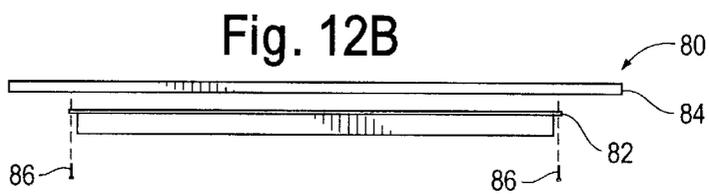
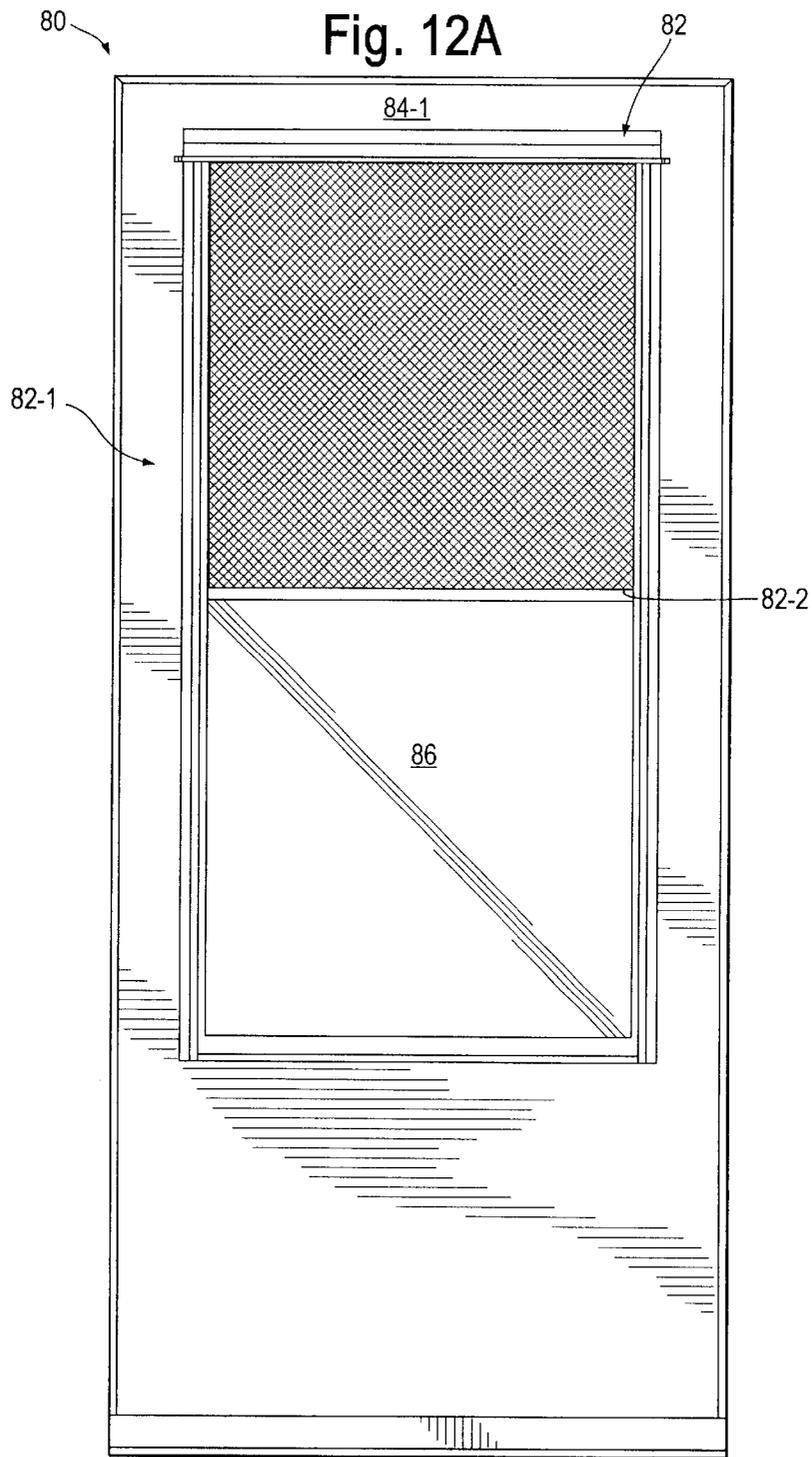


Fig. 11F





**DOOR WITH VARIABLE LENGTH SCREEN**

This application is a utility application claiming the benefit of the earlier filing date of provisional application Ser. No. 60/310,557 filed Aug. 7, 2001.

**FIELD OF THE INVENTION**

The invention pertains to doors. More particularly, the invention pertains to doors having at least one slidable glass pane or panel with an extendable screen attached thereto.

**BACKGROUND OF THE INVENTION**

Storm doors which incorporate panes of glass and screens are known. Some forms of such doors include screens which are fixedly mounted to the frame of the door with sliding glass inserts. With these doors, the inserts usually can be locked into a plurality of vertical positions with spring loaded latches to expose varying degrees of screen. When the inserts are moved to their fully close position, such as during storms or in cold weather, a person looking at the door, must look through at least one pane of glass and the screen.

In other forms of doors, glass inserts or screen inserts are installed on the doors' frame depending on the season. In warmer weather the glass insert is removed and a screen insert is used in the frame. In cooler weather, the screen is removed and a glass insert is attached to the frame. With such doors, an individual looking at the door looks through either a pane of glass or a screen but not both.

One known door configuration provides a fixed screen with a counterbalanced insert. In this configuration, the insert is not latched at a selected position on its track. The counterbalance makes it possible to position the insert at any desired position on the track. However, when the insert is in its closed position, a person viewing the door must look through both the glass insert and the screen.

Patio door configurations are known which include sliding glass doors which can be opened or closed to provide access to a patio or a porch. Spring biased screen modules are known which can be attached to the patio door frame. These modules include horizontally retractable screens which can be extended across a patio door opening to exclude insects or other flying pests.

While the known doors are generally suitable for their intended purpose, they all suffer from one or more deficiencies in performance, convenience and ease of use. There continues to be a need for multi-season doors which provide convenient and easy to use screened openings during warmer drier weather while at the same time making it possible to easily close the screened area with a glass pane during cooler or wetter weather. Preferably such doors could be manufactured, at least in part, using techniques for manufacturing existing doors so as to benefit from the economies of scale that such manufacturing capabilities provide. Additionally, it would be preferable if such doors were easy to maintain and designed to be forgiving in the event that the screen is in need of replacement.

Numerous other advantages and features of the present invention will become readily apparent from the following detailed description of the invention and the embodiments thereof, from the claims and from the accompanying drawings.

**BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1A is a front elevational view of a door in accordance with the present invention;

FIG. 1B is a top plan view of the door of FIG. 1A; FIG. 1C is a side view of the door of FIG. 1A; FIG. 2A is a rear elevational view of the door of FIG. 1A; FIG. 2B is a rear elevational view of an alternate door in accordance with the invention;

FIG. 3A is an exploded view of the door of FIG. 1A; FIG. 3B is a rear isometric view of the door of FIG. 1A; FIG. 4A is an exploded view of an alternate embodiment of the door of FIG. 1A;

FIG. 4B is a rear isometric view of the door of FIG. 4A; FIGS. 5A and B are side sectional views taken along plane 5A—5A of the door of FIG. 1A;

FIG. 5C is a sectional view taken along plane 5C—5C of the door of FIG. 1A;

FIG. 5D is an enlargement of a portion of the section of FIG. 5C;

FIG. 5E is a sectional view taken along plane 5E—5E of FIG. 5A;

FIG. 5F is an enlarged partial view of a portion of the door of FIG. 1A illustrating details thereof;

FIG. 5G is an enlarged partial view illustrating details of an alternate embodiment of the door of FIG. 1A;

FIGS. 6A, 6B and 6C taken together are isometric views illustrating a process of engaging an extendable screen cloth with the jambs of the door of FIG. 1A;

FIGS. 7A—7C illustrate details of a replaceable screen module usable in the door of FIG. 1A;

FIG. 8 is a rear isometric view of the door of FIG. 1A illustrating aspects of removing and replacing the screen module;

FIG. 9 is an enlarged region of a portion of FIG. 8 illustrating additional details thereof;

FIG. 10 is a front elevational view of another door which embodies the invention;

FIG. 10A is a side section of the door of FIG. 10 taken along plane 10A—10A;

FIG. 11 illustrates an end sectional view of a plurality of alternate mechanisms for coupling a retractable screen to a movable door insert; and

FIG. 12 is a rear elevational view of another door in accordance with the present invention.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

While this invention is susceptible of embodiment in many different forms, there are shown in the drawing and will be described herein in detail specific embodiments thereof with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the specific embodiments illustrated.

In one embodiment of the invention, an exterior door incorporates a replaceable screen module which includes an integral, spring biased, retractable screen which is coupled to a movable glass insert in the door. As the insert is moved from the screen, the screen is withdrawn from its retracted position and extends along the frame of the door screening the otherwise open region from which the glass insert has moved. As the window sash or insert moves in the opposite direction toward the screen module, the screen is retracted into the module reducing the ventilation region available in the door.

FIGS. 1A—1C illustrate various views of a door 10 which embodies the present invention. The door 10 includes a

header **12a**, two door jambs **12b, c** and a sill **12d**. The members **12a . . . d** define a door frame with an interior region which in the door **10** includes a kick plate generally indicated at **14a**, a lower pane or glass insert **14b**, and an upper pane or glass insert **14c**. Mullions **18a, b** on the exterior side of the frame join jambs **12b, c**.

In the door **10**, the pane or insert **14b** is fixedly mounted between the jambs **12b, c** and above the kick plate **14a**. The pane or insert **14c** is mounted in tracks, discussed in more detail subsequently, for vertical motion generally in directions **16a, b** relatively to insert **14b**.

When the insert **14c** is positioned at its uppermost location adjacent to header **12a**, the door **10** is fully closed with two glass panes as one would use it in cool or wet weather. The pane or insert **14c** can be moved, vertically, in direction **16b**, away from header **12a** thereby opening the upper portion of door **10** for ventilation.

A screen module **20**, best seen in FIG. 7A can be coupled to the jambs **12b, c**, header **12a** or sill **12d**. Module **20** carries a retracted screen which has a free end which carries an attachment member **22** which is coupled to an upper end of insert **14c**. As the insert **14c** is moved in the direction **16b**, screen fabric or material **22-1** from the module **20** is extracted therefrom filling any gap or space between an upper end of insert **14c** and header **12a**.

Door **10** can thus, as described above, be converted from a storm door with two glass panes to a screen door simply by moving pane or insert **14c** vertically downwardly. Where insert **14c** is moved vertically downwardly to kick plate **14a**, the extracted screen fills the entire area previously closed by pane **14c**.

When the insert **14c** is raised, direction **16a**, the screen material **22-1** retracts into module **20** for storage. As discussed below, module **20** is removable for maintenance or replacement.

It will be understood that alternate configurations to the door **10** come within the spirit and scope of the present invention. For example, the screen module **20** can be mounted at or near the base **12d** to provide an openable lower screened region. Alternately, instead of screening material, sheet plastic could be used in the module **20**.

Members **12a-12d** of the frame for the door **10** can be formed of metal, such as extruded aluminum, extruded or molded plastic, or partly or completely of a wood product. Inserts **14b, c** need not include glass but could in fact be closed with translucent or transparent plastic material without departing from the spirit and scope of the present invention.

FIG. 2A is a rear elevational view of the door **10** illustrating the location of screen module **20** adjacent to header **12a**. Screen module **20** is enclosed by a removable cover **24** which can be removed for purposes of maintenance and for replacing the module **20**.

FIG. 2B illustrates an alternate embodiment, a wood core door **10-1** which incorporates screen module **20**. The wood core door **10-1** can be formed with a wood-products core covered with either metal, such as aluminum, or cured resin such as vinyl. It will be understood that the screen module **20** is coupled to a sash or insert, comparable to the insert **14c**, which moves vertically in tracks, as would be understood by those of skill, in the frame for the door **10-1**.

FIGS. 3A and 3B are an exploded view of the door **10** and a rear isometric view thereof.

As illustrated in FIG. 3A, module **20** incorporates a spring or retractor assembly **26** which is carried in a hollow screen

roll or cylinder **28**. The cylinder **28** rotates about retractor assembly **26** and pivot cap **28-1**.

The module **20** is attached to the door so as to permit rotary motion thereof by brackets **30-1** and **30-2**, best seen in FIGS. 7A-C. Screen roll **28** carries the coiled screen fabric **22-1** with attached connection member **22**, best seen in FIG. 7B.

The spring assembly **26** exerts a substantially constant retracting force on the spring fabric on the roll **28** as the insert **14c** is moved vertically in directions **16a, b**. The screen material **22-1** is thus constantly under tension.

The insert **14c** in door **10**, is counterbalanced by counterbalancing mechanisms **36a, b** carried by the insert **12a**. The counterbalancing mechanisms **36a, b** move with the insert **14a** in the jambs **12b, c** and are invisible to the user. Types of counterbalances include block and tackle balance, spiral balance and coil spring balance.

The counterbalances **36a, b** make it possible to smoothly move the insert **14c** in the direction **16a, b**. The insert **14c** can be positioned anywhere along its range of travel and will remain there until moved due to the forces exerted by the counterbalance mechanisms **36a, b**.

FIGS. 4A, B illustrate an alternate embodiment, a door **10-2**, which embodies the present invention. Those elements of door **10-2** which correspond to previously discussed elements of the door **10** have been assigned the same identification numerals. As an alternate to the counterbalance mechanisms **36a, b**, the door **10-2** incorporates spring biased finger operable latches **38a, b** which are carried by the insert **14c'**. The latches extend laterally outwardly into slots in the jambs **12b', c'** to lock the insert **14c'** into a plurality of spaced apart vertical positions.

In the door **10-2**, the insert **14c'** can be moved vertically to a locking position, the movement will retract the screen **22-1** off of the roll **28** and filling the area of the door frame from which the insert **14c'** has been moved. The mechanical latches **38a, b** will lock the insert **14c'** at the desired degree of openness in the frame of the door **10-2** desired.

In yet another embodiment, insert **14c** can frictionally engage tracks in jambs **23b, c**. The frictional forces will support insert **14c** at any one of a variety of positions. In this embodiment, no counterbalances or latches are needed.

FIGS. 5A and 5B are sectional views taken along plane **5A-5A** of FIG. 1A. The views of FIGS., 5A, B illustrate the relationship of various structural elements of the door **10** as the insert **14c** moves from a fully closed position, FIG. 5A, to a partially open position, FIG. 5B. FIG. 5B illustrates the extended screen fabric **22-1**.

FIG. 5C, a section taken along plane **5C-5C** of FIG. 1A illustrates the insert tracks **52b, 52c** which run axially along each of the jambs **12b, c**. The insert **14c** moves axially in and is retained within those tracks.

As illustrated in FIG. 5B, the insert **14c** which is coupled to the screen fabric **22-1** moves axially in tracks **52b, c** between insert **14b** and mullion **18a**. The screen end retaining member **22** is slidably received in a retaining feature **50** located at an upper end of the insert **14c**.

Edges of the screen fabric **22-1** are confined in axial tracks **54-1, -2**. These can be formed in jambs **12b, c**.

FIG. 5D illustrates the counterbalance mechanism **36a, b** which is carried by the insert **14c**. Hence, insert **14c** can be located at any vertical position on its range of travel as defined by the tracks **52b, 52c** along the jambs **12b, c**. When so positioned, the screen fabric **22-1**, will be extended from the module **20** to the connector feature **50** to close the

opening in the frame of the door 10 left by moving the insert 14c to a position closer to the kick plate 14a.

FIG. 5D also illustrates the screen material 22-1, illustrated in phantom, extended, as in FIG. 5B, extending between first and second weather stripping elements 54a and 54b. Weather stripping element 54a extends axially along the respective jamb 12b, c on each side of the door 10. The weather stripping 54a can be any form of weather stripping as would be known to those of skill in the art.

The weather stripping 54b is different and unlike the weather stripping 54a. The weather stripping 54b is also positioned in an axially oriented slot which runs along the jambs 12b, c.

Weather stripping 54b is commercially available from Reddiplex Group PLC, Worchestershire, England under the trade name "MESHLOCK" and is formed with a mounting section 56-1 which slidably engages the respective slot in the jamb 12b, c. The mounting section 56-1 carries a deflectable planar element 56-2 which extends from the mounting section 56-1 toward the weather stripping 54a at a predetermined angle in a range of 15-75° relative to the plane of the screen.

The weather stripping 54a acts to press the edge of the screen material 22-1 toward the MESHLOCK-type weather stripping 54b, see FIG. 5F. This interaction provides a screen edge retention function. The fibers of the MESHLOCK weather stripping 54b resist screen material 22-1 being pulled from between weather stripping 54a, b, and the tracks 54-1, -2.

It will be understood that other commercially available forms of weather stripping can be used instead of the MESHLOCK brand without departing from the spirit and scope of the invention.

It will be understood that while the MESHLOCK weather strip 54b has been illustrated in FIGS. 5D and 5F as exhibiting an acute angle between the mounting section 56-1 and the screen retaining section 56-2, other variations of MESHLOCK weather stripping could be used. Alternately as in FIG. 5C, the members 56-1', -2' could be oriented at 90° to one another. In this embodiment, the track in which the mounting section 56-1' would be located would be oriented at an appropriate angle, best seen in FIG. 5G, relative to the respective jamb 12b, c to provide the desired interaction of pressing the screen material 22-1 between the weather stripping 54a, 54b'.

FIGS. 6A, B and C taken together illustrate screen fabric or cloth 22-1 slidably engaging track 54-1, similarly 54-2, located in each of the jambs 12b, c and which extend axially along the jamb. The end attachment feature 22 also slidably engages the track or slot 54-1, -2 on each of the jambs 12b, c.

Though the screen cloth or material 22-1 may be forced out of the respective tracks 54-1, -2 in each of jambs by a laterally directed force, the screen attachment member 22 will continue to remain in each of the tracks. This is facilitated by the shape of the attachment member 22 which includes an end region 23 which extends into the respective slot 54-1, -2.

In this instance, assuming that the screen cloth 22-1 has been forced from the respective track 54-1, the upper insert 14c can be moved to its fully closed position adjacent to header 12a to retract the screen onto the screen roll 28. In this circumstance, the attachment feature 22 is properly aligned to re-enter the tracks 54-1. As the insert 14c is moved away from the header 12a, it will pull the attachment member 22 with it. The ends 23 of the attachment member

22 will enter the respective slots 54-1 pulling the screen cloth 22-1 with them and retracting the screen. Alternately, the attachment member 22 can exhibit a retracted condition, adjacent to the screen module 20 while continuing to remain in the tracks 54-1.

Thus, as described above, if a force is exerted against the screen material 22-1 to pull it out of the side tracks 54-1 in each jamb, it is only necessary to reclose the insert 14c to rewind the screen material 22-1 into a proper configuration so that it will be immediately re-extendable into the slots or tracks 54-1.

FIGS. 7A, 7B and 7C illustrate additional details of the screen module 20. The module 20 is supported adjacent to the header 12a by brackets 30-1, -2. Module 20 can be removably attached to the header, the sill or the jambs. The module 20 is removable from the brackets 30-1, -2 for maintenance and/or replacement once the cover 24 has been removed from the respective door.

FIG. 8 illustrates additional details of removing and replacing the module 20. The connecting member 22 can be slid from the retaining feature 50 of the insert 14c as illustrated in FIGS. 8 and 9. When so-slid from the retaining feature 50, the entire module 20 can be replaced. Replacement involves attaching the connecting member of the new module to the attachment feature 50 by reversing the process illustrated in FIGS. 8 and 9. The screen roll 28 and screen fabric 22-1 can then be reattached brackets such as brackets 30-1, -2 in the header of the respective door. The cover 24 can be replaced. Moving the insert 14c vertically toward and away from the header will cause the screen fabric 22-1 of the replacement module to retract and extend as expected.

FIGS. 10, 10A and 10B illustrate a door 60 which has a header 62a, jambs 62b, c and a sill 62d. The door 60 includes insert 64a which is movable vertically toward the header 62a and away therefrom toward the sill 62d. The insert 64a can be supported by counterbalances, latches or frictional forces as discussed above relative to the door 10.

The door 60 carries a screen module 66, best illustrated in FIG. 10A. A free end of the screen of the screen module 66 is coupled to an upper end of insert 64a as discussed above.

A lower panel 64b of the door 60 is hollow and contains a space into which the insert 64a can be stored as it is moved downwardly toward the sill 62d. In this configuration, where the insert 64a is partly open, a portion of the screen 66a extends from the screen module 66 and fills the open space between jambs 62b, c and header 62a. The remainder of the space between the jambs 62b, c is filled by a portion of the insert 64a and the panel 64b. Thus, the door 60 provides convenient out of sight storage for the insert 64a.

FIG. 11 illustrates a plurality of alternate coupling members 50-1 . . . 50-6 that could be carried on the movable insert or pane, such as the insert 14c, and couplable to a free end of the screen fabric 22-1. As illustrated in FIG. 11, in each instance, the free end of the screen 22-1 would include a coupling element, such as 22-2 . . . 22-7 which would slidably engage the respective coupling member 50-1 . . . 50-6.

It will be understood that other arrangements can be used to attach a free end of the screen member 22-1 to a moving insert or pane. Alternates or include a spline which would trap the free end of the screen fabric 22-1 in contact with the movable inserts such as 14c clamps or adhesives. Other variations come within the spirit and scope of the invention.

FIG. 12 illustrates a door 80 which incorporates a screen module 82, of the type discussed previously, which can be attached to door 84 as an after the fact accessory or add-on.

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The module screen **82** can be attached to the door **84** by fasteners **86** in the vicinity of the header **84-1** of the door.

The screen fabric **82-1** can be pulled from the module **82** to close an opening in the door created by moving insert **86** downwardly away from the module **82**. A free end **82-2** of the screen material **82-1** is attached to the sash or insert **86**. Attachment can be effected by any of the previously discussed methods including using a spline, adhesive, providing attachment clips which slidably engage a portion of the sash of the insert **86**. Other attachment vehicles can be used to connect the free end **82-2** to an upper end of the insert or sash **86** without departing from the spirit and scope of the present invention.

As the sash or insert **86** is moved toward the screen module **82**, the fabric **82-1** rollably retracts into the module **82** as a result of the internal spring mechanism, discussed above, in connection with door **10**. The screen material **82-1**, also as discussed above, is under a constant pulling force due to the spring biasing mechanism of the module **82** which continually attempts to retract the fabric **82-1** into the module **82**. Thus, as the sash or insert **86** moves toward the module **82**, the screen material **82-1** is immediately rolled into the module **82** for out of the way storage.

It will also be understood that a resin or plastic sheet could be used as an alternate to screen fabric **82-1** without departing from the spirit and scope of the present invention. Thus, the screen module **82** provides a mechanism for adding to any existing door, after installation, a retractable screen feature such that existing screen panels or inserts in the door can be removed. This improves convenience and visibility in that with the sash or insert **86** closed, the screen fabric **82-1** is completely retracted and an individual looking at the door looks directly through the glass inserts or sashes without having to look through a screen.

From the foregoing, it will be observed that numerous variations and modifications may be effected without departing from the spirit and scope of the invention. It is to be understood that no limitation with respect to the specific apparatus illustrated herein is intended or should be inferred. It is, of course, intended to cover by the appended claims all such modifications as fall within the scope of the claims.

What is claimed:

**1.** A door comprising:

first and second spaced apart jambs wherein each jamb carries an axially oriented insert track, an adjacent axially oriented fabric track, and an axially oriented fabric edge retainer;

a spring biased roll of sheet material rotatably carried at one end of the jambs wherein the sheet material is removable from the roll and extends axially along at least part of the jambs with the edges of the sheet material located in respective fabric tracks engaged with respective edge retainers;

wherein the edge retainers each include at least one elongated weather stripping element wherein an edge region of the sheet material slidably engages the weather stripping element; and

wherein the edge retainers each include a second elongated, different weather stripping element spaced from the one weather stripping element wherein an edge region of the sheet material extends laterally between the weather stripping elements.

**2.** A door as in claim **1** which includes an insert slidably movable in the insert tracks toward and away from respective ends of the jambs wherein the insert is coupled to the sheet material.

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**3.** A door as in claim **2** which includes one of a counterbalance, a latch or friction between the insert and the respective jambs, for slidably supporting the insert at each of a plurality of axially displaced locations along the jambs.

**4.** A door as in claim **1** which includes one of a counterbalance, a latch or friction between the insert and the respective jambs, for slidably supporting the insert at each of a plurality of axially displaced locations along the jambs.

**5.** A door as in claim **1** wherein a free end of the sheet material is attached to a sash slidably mounted between the jambs.

**6.** A door as in claim **5** wherein the free end of the sheet material carries a coupling element which engages a coupling feature of the sash.

**7.** A door comprising:

first and second spaced apart jambs wherein each jamb carries an axially oriented insert track, an adjacent axially oriented fabric track, and an axially oriented fabric edge retainer;

a spring biased roll of sheet material rotatably carried at one end of the jambs wherein the sheet material is removable from the roll and extends axially along at least part of the jambs with the edges of the sheet material located in respective fabric tracks engaged with respective edge retainers;

wherein a free end of the sheet material is attached to a sash slidably mounted between the jambs; and

wherein the edge retainers each include first and second different strips of weather stripping with one strip having first and second planar sections attached to one another at a selected angle.

**8.** A door as in claim **7** configured with a portion of the one strip exhibiting an angle in a range of fifteen to seventy-five degrees relative to the extended sheet material.

**9.** A door as in claim **1** wherein each edge retainer is positioned in a respective fabric track and each includes spaced apart, weather stripping with an edge of the sheet material slidable therebetween.

**10.** A door as in claim **9** wherein the sheet material has a free end which carries an elongated insert attachment member, L-shaped at least in part, and slidably engageable with an insert.

**11.** A door as in claim **10** wherein at least part of the insert attachment member has first and second spaced apart ends which extend into and slide between the weather stripping in each fabric track.

**12.** A door as in claim **11** wherein the sheet material slidably extends between weather stripping, and, if deflected so as to slide out from between the weather stripping, the sheet material can be rotated onto the roll and then re-extended between the weather stripping, by movement of the insert attachment member toward and then away from the roll.

**13.** A door as in claim **11** wherein the insert attachment member comprises, at least in part, metal or resin.

**14.** A door comprising:

first and second spaced apart jambs, the jambs are connected at one end by a header and at the other end by a sill wherein each jamb carries an axially oriented insert track, and an axially oriented fabric track;

elongated, facing, weather stripping located in each fabric track wherein first and second portions of the weather stripping face one another;

a screen module coupled to the header, the screen module carries a retractable screen having a selected width and having a free end wherein the free end is attached to an

elongated feed assembly that extends at least across the width of the screen and which carries an elongated L-shaped connector element;

an insert carried in and movable in the insert tracks wherein the insert is positionable at a plurality of locations along the jambs and wherein the connector element slidably engages an elongated section of the insert whereby as the insert moves toward the sill the screen is extracted from the module and edges of the screen and ends of the elongated feed assembly slide in the fabric tracks between facing weather stripping portions with the screen retracting into the module as the insert moves toward the header.

15. A door as in claim 14 wherein the connector element is formed, at least in part, of one of metal or resin.

16. A door as in claim 15 wherein parts of the feed assembly and the connector element are integrally formed.

17. A door as in claim 15 including an elongated plastic body attached to the free end wherein the plastic body has ends that extend between the weather stripping in the fabric tracks.

18. A door as in claim 14 wherein in response to an applied lateral force, the screen deflects laterally relative to the jambs, withdrawing, at least in the deflected region, from the fabric tracks and, in the absence of that force, responsive to moving the insert adjacent to the module, the edges of the screen are positioned for re-entry to the fabric tracks, between the weather stripping, as the insert moves toward the sill.

19. A door as in claim 14 which carries one of insert latching elements, or, insert counterbalancing elements for positioning the insert at the plurality of locations.

20. A door an in claim 18 which carries one of insert latching elements, or, insert counterbalancing elements for positioning the insert at the plurality of locations.

21. A door comprising:

first and second spaced apart jambs joined by a header and a sill to bound an internal region, each of the jambs carries an insert track and an adjacent generally U-shaped screen track, the insert tracks open toward one another, the screen tracks open toward one another, the screen tracks each carry elongated weather stripping at least some of which extends toward the adjacent insert track; a glass insert, slidable in the insert track toward and away from the header, the insert has an end, closest to the header, which extends between the jambs with an elongated connection region formed on the end and the insert carries latches for engaging the jambs in a plurality of spaced apart locations; a screen module carried adjacent to the header wherein the module includes a biased roll of screen having a free end with the screen and the free end extending between the jambs and the weather stripping in the screen tracks, the free end carrying an elongated engagement feature including an L-shaped member for slidably engaging the elongated connection region formed on the end of the insert such that as the insert moves toward the sill, the screen is extracted from the roll and slides in the screen track between weather stripping with part of the engagement feature extending into the screen tracks, between the weather stripping, and as the insert is moved toward the header, the screen retracts into the module and wherein ends of the engagement feature are located adjacent to at least part of the screen track, when the screen is fully retracted.

22. A door as in claim 21 wherein the L-shaped member comprises one of resin or metal.

\* \* \* \* \*



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(12) **EX PARTE REEXAMINATION CERTIFICATE (5524th)**  
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**Thomas et al.**

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(45) **Certificate Issued: Sep. 19, 2006**

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- (58) **Field of Classification Search** ..... **52/63,**  
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See application file for complete search history.

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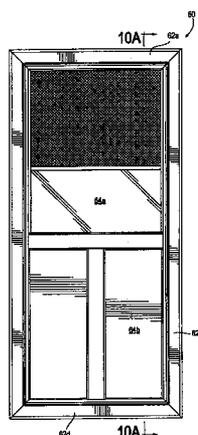
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- (57) **ABSTRACT**

An exterior door incorporates at least one moving glass insert or sash slidable in first and second spaced apart tracks. An end of the insert is coupled to an end of a spring biased rolled screen. As the insert moves from the roll, the screen is extracted therefrom providing a continuously variable screened region in the door. The insert can be positioned using a counterbalance or spaced apart latchable locations in the door.



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EMCO Specialities, *Forever Storm & Screen Doors*, copyright 1998, United States of America.

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**EX PARTE  
REEXAMINATION CERTIFICATE  
ISSUED UNDER 35 U.S.C. 307**

THE PATENT IS HEREBY AMENDED AS  
INDICATED BELOW.

**Matter enclosed in heavy brackets [ ] appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 14-19 is confirmed.

Claims 1-10 are cancelled.

Claims 11, 20 and 21 are determined to be patentable as amended.

Claims 12, 13 and 22, dependent on an amended claim, are determined to be patentable.

11. [A door as in claim 10] *A door comprising:*

*first and second spaced apart jambs wherein each jamb carries an axially oriented insert track, an adjacent axially oriented fabric track, and an axially oriented fabric edge retainer;*

*a spring biased roll of sheet material rotatably carried at one end of the jambs wherein the sheet material is removable from the roll and extends axially along at least part of the jambs with the edges of the sheet material located in respective fabric tracks engaged with respective edge retainers;*

*wherein the edge retainers each include at least one elongated weather stripping element wherein an edge region of the sheet material slidably engages the weather stripping element;*

*wherein the edge retainers each include a second elongated, different weather stripping element spaced from the one weather stripping element wherein an edge region of the sheet material extends laterally between the weather stripping elements;*

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*wherein each edge retainer is positioned in a respective fabric track and each includes spaced apart, weather stripping with an edge of the sheet material slidable therebetween;*

*wherein the sheet material has a free end which carries an elongated insert attachment member, L-shaped at least in part, and slidably engageable with an insert; and wherein at least part of the insert attachment member has first and second spaced apart ends which extend into and slide between the weather stripping in each fabric track.*

20. A door [an] as in claim 18 which carries one of insert latching elements, or, insert counterbalancing elements for positioning the insert at the plurality of locations.

21. A door comprising:

first and second spaced apart jambs joined by a header and a sill to bound an internal region, each of the jambs carries an insert track and an adjacent generally U-shaped screen track, the insert tracks open toward one another, the screen tracks open toward one another, the screen tracks each carry elongated weather stripping at least some of which extends toward the adjacent insert track; a glass insert, slidable in the insert track toward and away from the header, the insert has an end, closest to the header, which extends between the jambs with an elongated connection region formed on the end and the insert carries latches for engaging the jambs in a plurality of spaced apart locations; a screen module carried adjacent to the header wherein the module includes a biased roll of screen having a free end with the screen and the free end extending between the jambs and the weather stripping in the screen tracks, the free end carrying an elongated engagement [feature] member including an L-shaped member for slidably engaging the elongated connection region formed on the end of the insert such that as the insert moves toward the sill, the screen is extracted from the roll and slides in the screen track between weather stripping with part of the engagement [feature] member extending into the screen tracks, between the weather stripping, and as the insert is moved toward the header, the screen retracts into the module and wherein ends of the engagement [feature] member are located adjacent to at least part of the screen track, when the screen is fully retracted.

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